



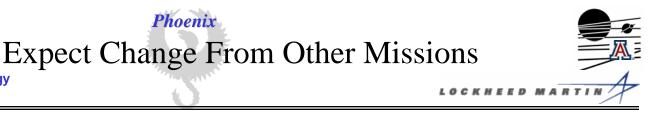
Lessons Learned in Step 2 Phase A



- All the principal proposal managers and most of the engineers have other demanding jobs
 - Pressured to make decisions without fully considering the impacts, "we'll resolve these issues in phase B"
- Less sense of ownership for an unselected mission by some participants
- Requirements are only defined at the highest levels
 - Costs must be tallied with little insight into the full complexity of the tasks
- Percentage of funds spent is miniscule
 - We are authorized less than 0.2% of the mission cost to do mission definition for selection (For Phoenix \$600K of \$386M)
- Phase A is a competition
 - Is this truly in the best interest of NASA?



Phoenix



- Phoenix knew we needed to address MSP'01 return to flight criteria
 - Addressed it early (e.g. Hot Fire Test-bed)
- Phoenix did not know the effects MER Entry Descent and Landing reconstruction
 - Unpredicted results and new findings added significant complexity to EDL development and test program.



Heritage--the False Confidence



 Many PI-led proposals must show substantial heritage to stay within the cost cap

Phoenix

- The Project rarely understands what they have inherited--black boxes that have flown before
- As requirements are flowed down in phase B, the black boxes, in many cases, cease to be a good match
- Schedule extensive heritage reviews early in Phase B
 - Learn your heritage assumption mistakes early, unlike a fine wine, they don't get better with age.